

# Athletes' perceptions of coaching effectiveness and athlete-related outcomes in rugby union: An investigation based on the coaching efficacy model

Boardley, Ian; Kavussanu, Maria; Ring, Christopher

## Document Version

Publisher's PDF, also known as Version of record

## Citation for published version (Harvard):

Boardley, I, Kavussanu, M & Ring, C 2008, 'Athletes' perceptions of coaching effectiveness and athlete-related outcomes in rugby union: An investigation based on the coaching efficacy model', *The Sport Psychologist*, vol. 22, no. 3, pp. 269-287.

[Link to publication on Research at Birmingham portal](#)

## Publisher Rights Statement:

Human Kinetics

## General rights

Unless a licence is specified above, all rights (including copyright and moral rights) in this document are retained by the authors and/or the copyright holders. The express permission of the copyright holder must be obtained for any use of this material other than for purposes permitted by law.

- Users may freely distribute the URL that is used to identify this publication.
- Users may download and/or print one copy of the publication from the University of Birmingham research portal for the purpose of private study or non-commercial research.
- User may use extracts from the document in line with the concept of 'fair dealing' under the Copyright, Designs and Patents Act 1988 (?)
- Users may not further distribute the material nor use it for the purposes of commercial gain.

Where a licence is displayed above, please note the terms and conditions of the licence govern your use of this document.

When citing, please reference the published version.

## Take down policy

While the University of Birmingham exercises care and attention in making items available there are rare occasions when an item has been uploaded in error or has been deemed to be commercially or otherwise sensitive.

If you believe that this is the case for this document, please contact [UBIRA@lists.bham.ac.uk](mailto:UBIRA@lists.bham.ac.uk) providing details and we will remove access to the work immediately and investigate.

# **Athletes' Perceptions of Coaching Effectiveness and Athlete-Related Outcomes in Rugby Union: An Investigation Based on the Coaching Efficacy Model**

**Ian D. Boardley, Maria Kavussanu, and Christopher Ring**  
University of Birmingham

This study examined the relationships between athletes' perceptions of coaching effectiveness, based on the coaching efficacy model, and their effort, commitment, enjoyment, self-efficacy, and prosocial and antisocial behavior in rugby union. Participants were 166 adult male rugby-union players ( $M$  age = 26.5,  $SD$  = 8.5 years), who completed questionnaires measuring their perceptions of four dimensions of coaching effectiveness as well as their effort, commitment, enjoyment, self-efficacy, and prosocial and antisocial behavior. Regression analyses, controlling for rugby experience, revealed that athletes' perceptions of motivation effectiveness predicted effort, commitment, and enjoyment. Further, perceptions of technique effectiveness predicted self-efficacy, while perceptions of character-building effectiveness predicted prosocial behavior. None of the perceived coaching effectiveness dimensions were related to antisocial behavior. In conclusion, athletes' evaluations of their coach's ability to motivate, provide instruction, and instill an attitude of fair play in his athletes have important implications for the variables measured in this study.

In the general coaching effectiveness literature, effective coaching behaviors are considered those that result in positive outcomes for athletes; examples of these outcomes are performance, enjoyment, self-esteem, and perceived ability (see Horn, 2002). Thus, effective coaches are generally those, who, through their behaviors, produce positive outcomes in athletes. However, models of coaching effectiveness also point to the central role of athletes' *perceptions* of coaching behaviors in affecting athlete-related outcomes (Horn, 2002; Smoll & Smith, 1989). Thus, in studies of coaching effectiveness, the investigation of athletes' *perceptions* of coaching behavior is important. In the current study, coaching effectiveness was operationalized based on the coaching efficacy model and athlete-related outcomes specified in this model were examined.

The construct of coaching efficacy was developed by Feltz and colleagues, who used Bandura's (1986, 1997) theory of self-efficacy as their guiding framework, and defined coaching efficacy as the extent to which coaches believe that they have the capacity to influence the learning and performance of their athletes (Feltz, Chase, Moritz, & Sullivan, 1999). Coaching efficacy has been described as multidimensional in nature, consisting of four dimensions: motivation, game strategy, technique, and character building (Feltz et al., 1999). Motivation efficacy is the confidence coaches have in their ability to influence the psychological skills and states of their athletes. Game strategy efficacy is the coaches' confidence in their ability to coach and lead their team to a successful performance during competition. Technique efficacy refers to the coaches' efficacy beliefs about their instructional and diagnostic skills. Finally, character-building efficacy concerns the coaches' beliefs in their ability to influence their athletes' personal development and positive attitude toward sport.

In their conceptual model of coaching efficacy, Feltz et al. (1999) proposed that high levels of coaching efficacy should result in several desirable outcomes for both coaches and athletes. For coaches, they suggested that coaching efficacy should influence coaching behaviors such as the type of feedback used, management strategies, and coaching style. Furthermore, highly efficacious coaches were hypothesized to demonstrate more effective motivational and corrective feedback techniques and tactical skills, more commitment to coaching, more character-development coaching, and lead their team to more successful performances. For athletes, they proposed that, compared with low-efficacy coaches, those high in coaching efficacy should have athletes who are more satisfied with their coach, perform better, are more confident and motivated, and display more positive attitudes about sportsmanship and more sportsmanlike behaviors.

Empirical research has confirmed some of the relationships posited in the coaching efficacy model. In coaches, coaching efficacy has been linked to commitment to coaching (Kent & Sullivan, 2003). In addition, intercollegiate coaches high in motivation and technique efficacy were more likely to report giving training and instruction and positive feedback to their players (Sullivan & Kent, 2003), while high school coaches characterized by high-efficacy displayed greater frequency of praise and encouragement and less instruction and organization than coaches low in efficacy (Feltz et al., 1999). In athletes, basketball (Feltz et al., 1999; Myers, Vargas-Tonsing, & Feltz, 2005), softball, baseball, and soccer players (Myers et al., 2005) coached by high-efficacy coaches reported significantly higher satisfaction with their coach and had a higher winning percentage than did those coached by low-efficacy coaches. Finally, coaching efficacy emerged as a significant predictor of team efficacy in volleyball players (Vargas-Tonsing, Warners, & Feltz, 2003).

The positive athlete-related outcomes associated with coaching efficacy suggest that high-efficacy coaches may be more effective than are those with low efficacy in that they are able to produce desired outcomes in athletes. This is not surprising if we consider the origins of the coaching efficacy construct. The construct was developed by identifying important dimensions of *effective coaching* repeatedly mentioned in the coaching education literature and through discussions with coaches (Feltz et al., 1999). Thus, the dimensions of coaching efficacy correspond to important components of effective coaching. Moreover, high-efficacy coaches are more likely to be successful in their career and therefore more effective in coaching

their athletes. Indeed, higher performance levels (Feltz et al., 1999) and winning percentages (Myers et al., 2005) have been evident in the teams of high-efficacy coaches when compared with the teams of low-efficacy coaches.

In the coaching effectiveness literature, coaching effectiveness is typically operationally defined in terms of outcome scores or measures (see Horn, 2002). In the current study, coaching effectiveness was defined as the extent to which coaches can implement their knowledge and skills to positively affect the learning and performance of their athletes. This definition was based on the coaching efficacy model (Feltz et al., 1999). Thus, coaching effectiveness refers to the ability of the coaches to *implement* their knowledge and skills, whereas coaching efficacy refers to coaches' *beliefs* of what they can do with their skills.

Effective coaches typically engage in certain behaviors, which in turn influence athlete outcomes (Horn, 2002; Smoll & Smith, 1989). However, the critical variable in coaching effectiveness is athletes' own perceptions of their coaches' behaviors. These perceptions are hypothesized to influence athletes' motivation, performance, and behavior (Horn, 2002) as well as athletes' evaluative reactions (Smoll & Smith, 1989). Despite the critical role of athletes' perceptions in coaching effectiveness, to date, only two studies have investigated athletes' perceptions of coaches' behaviors on the four coaching efficacy domains.

In the first study to examine such perceptions, Myers, Feltz, and colleagues (Myers, Feltz, Maier, Wolfe, & Reckase, 2006) proposed the construct of coaching competency, which they defined as "athletes' evaluations of their head coach's ability to affect their learning and performance" (p. 113). In examining athletes' perceptions, these researchers asked intercollegiate soccer and ice-hockey players to indicate how competent they thought their head coach was in the coaching efficacy domains of motivation, game strategy, technique, and character building. They found that coaching competency consists of the same four dimensions that make up coaching efficacy. In a second study using the same sample, the relationship between athletes' perceptions of their head coach's competency and their satisfaction with their coach was examined (Myers, Wolfe, Maier, Feltz, & Reckase, 2006). Perceptions of motivation competency had a moderately large and positive relationship with athletes' satisfaction with their coach at the athlete level, but were unrelated to team satisfaction at the team level after controlling for the athlete-level effects.

The above studies have made an important contribution to the literature by (1) recognizing the role of athletes' perceptions of coaching behaviors on the four coaching efficacy domains in influencing athlete-related outcomes; (2) measuring athletes' perceptions of their coach's *competence* in performing these behaviors; and (3) examining the relationship between athletes' perceptions of their coach's competency and athlete satisfaction, an outcome variable hypothesized in the coaching efficacy model. The present study sought to extend this literature by investigating athletes' perceptions of coaching *effectiveness* in relation to several outcome variables hypothesized in the coaching efficacy model. We focused on effectiveness rather than competence because effectiveness is concerned with the outcomes or results one produces, whereas competence pertains to the skills one has. From an applied perspective, we believe that being able to produce desirable outcomes has more important implications for the athletes' experiences than being perceived as merely having the skills to do so.

The first two variables examined in this study were effort and sport commitment. Effort has been traditionally used as a behavioral indicator of motivation (Maehr & Braskamp, 1986), while sport commitment is a psychological state, reflecting the aspiration and determination to continue participation in a sport (Scanlan, Simons, Carpenter, Schmidt, & Keeler, 1993); continued participation in an activity also reflects motivation (Maehr & Nicholls, 1980). Thus, effort and sport commitment essentially reflect athlete motivation, which is one of the hypothesized outcomes in the conceptual model of coaching efficacy (Feltz et al., 1999). Motivation is also one of the dimensions of coaching efficacy, that is, coaches' confidence in their ability to influence the psychological skills and states of their athletes including the ability to motivate them. Based on the above, we hypothesized that players' perceptions that their coach is effective in motivating them and influencing their psychological states would be associated with their effort and commitment to play rugby.

One other variable that has been proposed to result from high coaching efficacy is athlete satisfaction (Feltz et al., 1999). Athlete satisfaction has been defined as "a positive affective state resulting from a complex evaluation of the structures, processes, and outcomes associated with the athletic experience" (Chelladurai & Riemer, 1997, p. 135). Previous research has reported a relationship between athletes' satisfaction with their coach and coaches' overall coaching efficacy (Feltz et al., 1999). In addition, athletes' satisfaction has been linked to their perceptions that their coach is competent in motivating them and influencing their psychological skills and states (Myers, Wolfe, et al., 2006).

A construct conceptually similar to satisfaction is sport enjoyment (Scanlan, Carpenter, Scanlan, Simons, & Lobel, 1993), which involves a positive emotional response to a sport experience that may include feelings such as pleasure, liking, and fun (Scanlan, Carpenter et al., 1993). The coaching efficacy model suggests that increased levels of coaching efficacy should result in higher levels of athlete satisfaction (Feltz et al., 1999). As both satisfaction and enjoyment involve a positive affective response to the sport experience, it is likely that the tenets of the coaching efficacy model applying to athletes' satisfaction are also relevant for their enjoyment. Sport enjoyment was examined in the current study as an outcome variable of perceived coaching effectiveness. Based on past research (Myers, Wolfe, et al., 2006), we hypothesized that players' perceptions that their coach is effective in motivation would be associated with their enjoyment. The construct of sport enjoyment is important not only because an enjoyable experience is more meaningful but also because of its consistent links with athlete commitment in sport (Carpenter et al., 1993; Weiss, Kimmel, & Smith, 2001).

One important facet of athletic development that may be influenced by perceptions of coach effectiveness is self-efficacy. Self-efficacy, which is an individual's belief in his or her ability to organize and execute a specific action or series of actions (Bandura, 1997), has been described as one of the most powerful psychological constructs thought to affect achievement endeavors in sport (Feltz, 1988). In the conceptual model of coaching efficacy, player efficacy has been identified as one of the variables likely to be influenced by coaching efficacy (Feltz et al., 1999). One coaching efficacy dimension highly relevant to player efficacy is technique. Coaches perceived as effective in technique should be able to teach the skills of their sport and develop athletes' abilities; acquired skills, when executed

successfully, should in turn lead to greater performance accomplishments. Because the major source of self-efficacy information is one's performance accomplishments (Bandura, 1997), we hypothesized that coaches perceived as effective in technique would have players with high self-efficacy to perform their sport.

Feltz et al. (1999) have also proposed that high levels of coach character-building efficacy should result in athletes demonstrating more sportsmanlike behaviors. Coaches who are confident in their ability to influence athletes' personal development and positive attitude toward sport are likely to have the necessary skills to do so, because a major source of self-efficacy is mastery accomplishments. If high-efficacy coaches implement their skills to influence athletes' positive attitude toward sport, they may be perceived as effective in this capacity by their athletes. Thus, athletes' perceptions of character-building coaching effectiveness may be related to athlete sportsmanlike conduct. A variable that has been recently examined in sport and is similar to sportsmanlike behavior is prosocial behavior (Kavussanu, 2006; Sage, Kavussanu, & Duda, 2006). Prosocial behaviors have been defined as actions intended to help or benefit another individual or group of individuals (Eisenberg & Mussen, 1998). Examples of these behaviors in rugby are helping an opponent off the floor and returning the ball to an opponent for a line-out or kick.

Although Feltz and colleagues (1999) proposed that coaches with high character-building efficacy would have players who demonstrate more sportsmanlike behaviors, they also pointed out that their model is preliminary and may include fewer outcomes of coaching efficacy than actually exist. It has been recently suggested that high levels of morality in sport involve high frequency of prosocial behaviors and low frequency of antisocial behaviors (Kavussanu, 2006), which have been defined as actions intended to harm or disadvantage another individual or groups of individuals (Kavussanu, 2006; Sage et al., 2006). Examples of these behaviors in rugby are deliberately committing a high tackle or trying to injure an opponent. Because morality is reflected in high frequency of prosocial and low frequency of antisocial acts, high levels of character-building effectiveness may be linked to low levels of antisocial behavior.

In sum, Feltz and colleagues (1999) proposed that coaching efficacy consists of four dimensions—motivation, game strategy, technique, and character building—and that highly-efficacious coaches exhibit certain behaviors and have players who are more satisfied, motivated, efficacious, and display sportsmanlike conduct. Models of coaching effectiveness (Horn, 2002; Smoll & Smith, 1989) suggest that coaches' behaviors exert their influence on athletes through athletes' perceptions. Highly efficacious coaches are assumed to engage in certain behaviors which are perceived by their athletes and these perceptions in turn may influence athlete variables.

The purpose of this study was to examine athletes' perceptions of coaching effectiveness on the four coaching efficacy domains as predictors of their effort, commitment, enjoyment, self-efficacy, and prosocial and antisocial behavior in rugby union. We hypothesized that (1) athletes' perceptions of motivation effectiveness would predict athletes' effort, commitment, and enjoyment; (2) athletes' perceptions of technique effectiveness would predict athletes' self-efficacy; and (3) athletes' perceptions of character-building effectiveness would positively predict prosocial and negatively predict antisocial behavior of athletes.



## Method

### Participants

One hundred sixty-six male players from nine rugby-union clubs participated in this study. The players were of varying standard (recreational = 23, amateur = 63, university = 54, and professional = 25; one participant did not answer this question). Their age ranged from 18 to 35 years ( $M = 23.34$ ,  $SD = 4.12$ ), their playing experience ranged from 2 to 26 years ( $M = 12.87$ ,  $SD = 4.54$ ), and the time with their current coach ranged from 1 to 10 years ( $M = 2.04$ ,  $SD = 1.22$ ).

### Procedure

After approval of the study from the Ethics Committee of a British university, letters were mailed to 25 clubs outlining the study protocol and requesting their participation in the study. Then, the head coaches of these clubs were contacted by telephone and a time and date for data collection were scheduled with those coaches ( $N = 9$ ) who agreed to allow their athletes to take part in the study. Two research assistants collected the data immediately before a training session. Participants were briefed about the study, were invited to participate, and were informed that all information would be kept confidential and used only for research purposes. Participants gave informed consent and completed the questionnaires individually. Following questionnaire completion, participants were fully debriefed and thanked. The data were collected between the months of December and March (2005–2006), which is a minimum of four months after the season had started.

### Measures

**Coaching Effectiveness.** Athletes' perceptions of coaching effectiveness were measured using an adapted version of the Coaching Efficacy Scale (CES; Feltz et al., 1999). This scale was adapted to measure athletes' perceptions of coaching effectiveness in another study that considered the perceptions of athletes from various sports (Kavussanu, Boardley, Jutkiewicz, Vincent, & Ring, in press). The CES consists of four subscales measuring motivation (7 items), game strategy (7 items), technique (6 items), and character-building efficacy (4 items). The items used in this study were identical to those used in the CES. Players were informed that coaches differ in their ability to positively affect and improve the learning and performance of their players and were asked to rate their coach's effectiveness by circling the appropriate number. The stem for each item was "In your opinion how effective is your coach in his ability to. . . ." Examples of items are "motivate his athletes" for motivation, "understand competitive strategies" for game strategy, "teach the skills of your sport" for technique, and "instill an attitude of fair play among his players" for character building. Athletes rated each item on a scale from 0 (*not at all effective*) to 10 (*extremely effective*). Responses on the items of each subscale were averaged to produce one score for each subscale. Subscale scores ranged from 0 to 10, with higher scores indicating greater perceived coaching effectiveness.

Confirmatory Factor Analysis (CFA) was used to examine the factor structure of the adapted scale. The fit indices used to test model fit were the Satorra-Bentler scaled chi-square ( $R\chi^2$ ), the Robust Comparative Fit Index (RCFI), the Root Mean

Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). Values greater than .90 for RCFI and less than .08 for RMSEA indicate reasonably good fit (Hu & Bentler, 1999), whereas SRMR should be below .10 (Kline, 2005). We specified the same four first-order factors found in previous research (Feltz et al., 1999; Kavussanu et al., in press; Myers, Feltz, et al., 2006): motivation, game strategy, technique, and character building. The first-order structure utilizing all 24 items failed to achieve an acceptable level of fit,  $R\chi^2(246) = 419.74$ ,  $R\chi^2/df = 1.71$ , RCFI = .87, RMSEA = .07, SRMR = .07, CAIC = -1084. Inspection of the standardized residuals and the Lagrange Multiplier test results indicated that the motivation item "how effective is your coach in his ability to mentally prepare his athletes for game strategies" was a better indicator of game strategy effectiveness.<sup>1</sup> Although it was originally developed to measure motivation, in past research this item has cross-loaded on motivation and game strategy (Feltz et al., 1999; Myers, Feltz et al., 2006). The same model with this item removed achieved an acceptable fit,  $R\chi^2(224) = 348.45$ ,  $R\chi^2/df = 1.56$ , RCFI = .90, RMSEA = .06, SRMR = .05, CAIC = -1021.<sup>2</sup> Therefore, this item was omitted from all subsequent analyses. The items, factor loadings, and error variances for the final model are presented in Table 1.

**Effort.** Players' effort was measured using a modified version of the effort subscale of the Intrinsic Motivation Inventory (Ryan, 1982) that consists of five items. Players were asked to indicate their level of effort by circling the appropriate number. Examples of items are "I put a lot of effort into playing rugby with this team" and "I try very hard when playing rugby with this team". Participants provided ratings on a scale ranging from 1 (*not at all true*) to 7 (*very true*). Scores ranged from 1 to 7, with higher scores indicating greater effort. The reliability ( $\alpha = .84$ ), and factorial and discriminant validity of this scale has been demonstrated in a study of undergraduate students enrolled in a physical education class ( $M$  age = 21.35 years; McAuley, Duncan, & Tammen, 1989). In a CFA performed on our data, the single-factor model had a less than acceptable fit to the data,  $R\chi^2 = 18.03(5)$ , RCFI = .94, RMSEA = .13, SRMR = .11. Modification indices suggested that the item "I don't put much effort into playing rugby with this team" was contributing significantly to model misfit. This item was therefore removed. The model without this item had an excellent fit to the data,  $R\chi^2 = .04(2)$ , RCFI = 1.00, RMSEA = .00, SRMR = .00. Consequently, only responses on the four items used in the final model were averaged to produce the score for effort.

**Sport Commitment.** Sport commitment was measured using four items that assess the psychological desire and resolve to continue sport participation (Scanlan, Carpenter et al., 1993). All items were scored on a 5-point scale. The following four items and respective anchors were used: "how dedicated are you to continue playing rugby with this team?" with anchors of "*not at all dedicated*" (1) and "*very dedicated*" (5); "how hard would it be for you to quit playing rugby with this team?" with anchors of "*not at all hard*" (1) and "*very hard*" (5); "how determined are you to keep playing rugby with this team?" with anchors of "*not at all determined*" (1) and "*very determined*" (5); and "what would you be willing to do to keep playing rugby with this team?" with anchors of "*nothing at all*" (1) and "*a lot of things*" (5). Responses on the four items were averaged to produce one score for sport commitment. Scores ranged from 0 to 5, with higher scores indicating greater



**Table 1** Standardized Factor Loadings and Error Variances (EV) for 23-Item First-Order Model

Subscale/Item	Item Order	Loading	EV
Motivation			
Help athletes maintain confidence in themselves	1	.76	.65
Build the self-esteem of his athletes	6	.79	.62
Motivate his athletes	10	.76	.65
Build team cohesion	12	.84	.54
Build the self-confidence of his athletes	15	.85	.52
Build team confidence	23	.85	.53
Game Strategy			
Recognize opposing team's strengths during competition	2	.83	.56
Understand competitive strategies	4	.83	.55
Adapt to different game situations	8	.82	.57
Recognize opposing team's weaknesses during competition	9	.84	.54
Make critical decisions during competition	11	.74	.67
Maximize his team's strengths during competition	17	.84	.55
Adjust his game strategy to fit his team's talent	21	.76	.65
Technique			
Demonstrate the skills of his sport	7	.70	.72
Coach individual athletes on technique	14	.71	.70
Develop athletes' abilities	16	.82	.57
Recognize talent in athletes	18	.71	.70
Detect skill errors	20	.76	.65
Teach the skills of his sport	22	.83	.56
Character Building			
Instill an attitude of good moral character	5	.80	.60
Instill an attitude of fair play among his athletes	13	.79	.62
Promote good sportsmanship	19	.75	.66
Instill an attitude of respect for others	24	.89	.47

commitment. Evidence for the factorial and discriminant validity and reliability ( $\alpha \geq .88$ ) of this scale has been demonstrated in youth-sport program participants (Scanlan, Simons et al., 1993). This scale has also been used with an adult sample of university staff and students engaging in exercise classes (Wilson, Rodgers, Carpenter, Hall, Hardy, & Fraser, 2004). In a CFA performed on our data, the single-factor model had an exceptional fit to the data,  $R\chi^2 = .96$  (2), RCFI = 1.00, RMSEA = 0.00, SRMR = 0.01.

**Enjoyment.** Players were asked four questions to assess their enjoyment with regard to playing rugby. These items were adapted from Scanlan, Carpenter et al. (1993) to be rugby-specific. Example items are, "Do you enjoy playing rugby with this team this season?" and "Do you like playing rugby with this team this season?" Items were answered using a scale with anchors of "*not at all*" (1) and "*very much*" (5). Participants' responses on the four items were averaged to produce one score for enjoyment. Scores ranged from 1 to 5, with higher scores indicating greater enjoyment. Evidence for the factorial and discriminant validity,

and reliability ( $\alpha \geq .90$ ) of this scale has been shown in a sample of youth-sport program participants (Scanlan, Simons, et al., 1993). This scale has also been used with adult recreational participants (e.g., Alexandris, Zahariadis, Tsorbatzoudis, & Grouios, 2002). In a CFA performed on our data, the single-factor model had an exceptional fit to the data,  $R\chi^2 = 2.27$  (2), RCFI = 1.00, RMSEA = 0.03, SRMR = 0.01.

**Task Self-Efficacy.** A rugby self-efficacy scale was developed and used in this study based on guidelines by Bandura (2001). Following discussions with university rugby players, ten key skills in rugby union were identified. To test face validity, the list of 10 skills was presented to a separate group of rugby players and trained coaches who subsequently agreed that these were key skills required by all players involved in this sport. Participants were asked to rate how confident they are that they could successfully execute each of these skills by circling the number that best indicated their degree of confidence. Then, the 10 skills were presented. Players rated their degree of confidence to successfully execute each skill on an 11-point Likert scale, with anchors of “*cannot do at all*” (0) and “*certain can do*” (10). Participants’ responses on the 10 items were averaged to produce one score for task self-efficacy. These scores ranged from 0 to 10 with higher scores indicating greater efficacy.

Exploratory factor analysis with principle axis extraction and direct oblimin rotation was used to examine the dimensionality of this scale. We extracted factors based on the point on the scree plot where there was a distinct change of slope (Cattell, 1966); this analysis revealed two factors (variance explained = 54.17%; eigenvalues = 4.49, 1.74). Seven items loaded on factor one, two loaded on factor two, and one item had interpretable loadings of similar strength on both factors. The items that loaded on the second factor pertained to efficacy in skills that required strength (i.e., help your team win the ball in rucks, turn opposition players in the tackle). In contrast, the items representing the first factor covered a range of skills and therefore symbolized the overall task self-efficacy we wished to measure. Based on this, the first factor was retained and the items that loaded only on the second factor were dropped; the item (i.e., tackle opposition players) that loaded on both factors was retained as it represented an aspect of rugby efficacy not symbolized by the other seven items. A factor analysis of these items resulted in a one-factor solution (variance explained = 46.01%; eigenvalue = 4.20). The items in the final scale were: tackle opposition players, make accurate passes, offload the ball to a team-mate out of tackles, beat an opposition player one-on-one when running with the ball, catch the ball without causing a knock-on, get back to your defensive position, support your team-mate with the ball, and catch the ball from high kicks.

**Prosocial and Antisocial Behavior.** Prosocial and antisocial behaviors in rugby were assessed using a 10-item measure adapted for the sport of rugby from a questionnaire originally developed for soccer (Sage et al., 2006). Sage et al. (2006), utilizing a sample of male footballers ( $M$  age = 25), provided evidence for the content validity of this scale and principal components analysis indicated that it consists of two dimensions, one prosocial and one antisocial. Players were instructed to think about the rugby matches they had played in the current season and indicate the frequency with which they had engaged in three prosocial and seven antisocial behaviors on a scale ranging from 1 (*never*) to 5 (*very often*). An example

of a prosocial item is “helped an opponent off the floor” while an example of an antisocial item is “deliberately committed a high, late, or spear tackle.” Participants’ responses were averaged across subscale items to produce one score for prosocial behavior and one for antisocial behavior. Subscale scores ranged from 1 to 5, with higher scores indicating greater frequency of each behavior type.

CFA was performed on our data to examine the fit of the two-factor (i.e., prosocial and antisocial behavior) model to the data. This analysis demonstrated a less than adequate fit,  $R\chi^2 = 78.43$  (33), RCFI = .79, RMSEA = .09, SRMR = .10. Modification indices suggested that correlating the errors of the items “deliberately punched or stamped on an opponent” and “deliberately obstructed an opponent” would result in a significant improvement in model fit. As both of these items describe deliberate acts aimed at opponents, we viewed this modification of the model as acceptable. A second CFA of a model in which the errors of these two items were correlated resulted in an acceptable fit of the model to the data,  $R\chi^2 = 59.36$  (32), RCFI = .88, RMSEA = .07, SRMR = .09.

## Results

### Descriptive Statistics and Scale Reliabilities

Descriptive statistics and Cronbach’s (1951) alpha coefficients for all variables are presented in Table 2. Players perceived their coach as highly effective in motivation, game strategy, technique, and character building and indicated high levels of effort, commitment, enjoyment, and self-efficacy in rugby. Players also reported that they engaged rarely to sometimes in prosocial and antisocial behavior during rugby matches. With the exception of the prosocial behavior scale, which was slightly below the generally-accepted .70 criterion, alpha coefficients for all scales indicated good to excellent (Nunnally, 1978) internal consistencies (see Table 2). The relatively low internal consistency of the prosocial behavior scale could be partly attributed to the small number of items (Cortina, 1993). Marginally acceptable reliability has also been reported in past research using a 3-item measure of prosocial behavior in soccer (e.g., Kavussanu, 2006).

### Correlational Analyses

Pearson correlations were computed to determine the relationships among the variables examined in this study. These results are presented in Table 3 and evaluated here in accordance with Cohen’s (1992) guidelines that correlations of .10, .30, and .50 represent small, medium, and large effect sizes, respectively. Perceptions of motivation effectiveness were strongly related with players’ commitment and enjoyment, and moderately related with players’ effort and self-efficacy. Perceptions of game strategy, technique, and character-building effectiveness had moderate associations with effort, commitment, enjoyment, and self-efficacy, and a weak relationship with prosocial behavior. None of the four coaching effectiveness dimensions was associated with antisocial behavior, while all four were strongly and positively interrelated. Rugby experience was correlated weakly with most outcome variables.

**Table 2 Descriptive Statistics and Alpha Coefficients (*N* = 166)**

Variable	$\alpha$	<i>M</i>	<i>SD</i>	Range	Scale range
Motivation PCE	.92	7.07	1.24	2.00–10.00	0–10
Game strategy PCE	.95	6.96	1.24	2.14–9.86	0–10
Character building PCE	.85	6.87	1.32	1.25–10.00	0–10
Technique PCE	.88	6.95	1.23	1.00–9.67	0–10
Total PCE	.97	6.97	1.13	1.65–9.57	0–10
Task self-efficacy	.86	7.70	1.11	3.38–10.00	0–10
Enjoyment	.94	4.16	0.79	2.00–5.00	1–5
Commitment	.90	4.19	0.70	1.75–5.00	1–5
Effort	.85	6.33	0.78	3.75–7.00	1–7
Prosocial behavior	.68	2.28	0.82	1.00–5.00	1–5
Antisocial behavior	.70	2.35	0.63	1.00–5.00	1–5
Rugby experience	—	12.87	4.54	2.00–26.00	—

*Note.* PCE = Perceived Coaching Effectiveness; Descriptive statistics for rugby experience are based on *n* = 154.

## Regression Analyses

Multiple regression analyses were performed to determine the role of specific coaching effectiveness dimensions in predicting the outcome variables. In these analyses, rugby experience was entered in the first step to control for its effects because the bivariate correlations revealed that this variable was weakly-to-moderately related to several outcome variables (see Table 3). In the second step we entered the coaching effectiveness dimension hypothesized to predict each specific criterion variable based on the conceptual model of coaching efficacy, past research findings, and inspection of the correlation matrix, as recommended by Myers, Feltz et al. (2006). Results of these analyses are presented in Table 4.

For effort and commitment, perceived motivation effectiveness was used as the predictor variable, because (1) effort and commitment reflect athlete motivation; therefore motivation effectiveness should predict these variables and (2) motivation effectiveness displayed the highest correlation with effort and commitment compared with the other three dimensions of coaching effectiveness (see Table 3). Rugby experience positively predicted both effort and commitment explaining 4% and 5% of the variance, respectively, in the two constructs. Perceived motivation effectiveness was a significant positive predictor of effort and commitment accounting for 25% and 27% of the variance, respectively.

Perceived motivation effectiveness was also used as the predictor for enjoyment, because previous research has linked athletes' satisfaction, which is conceptually similar to enjoyment, with athletes' perceptions that their coach is competent in motivation (Myers, Wolfe, et al., 2006). Moreover, this dimension was the one most highly related to enjoyment compared with the other coaching effectiveness dimensions. As can be seen in Table 4, motivation effectiveness was a significant positive predictor of enjoyment accounting for 28% of the variance after controlling for rugby experience, which accounted for only 2% of the variance.

Table 3 Zero-Order Correlations Among Variables (N = 166)

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1. Motivation PCE	—											
2. Game strategy PCE	.69**	—										
3. Technique PCE	.74**	.85**	—									
4. Character building PCE	.74**	.73**	.72**	—								
5. Total PCE	.88**	.92**	.93**	.86**	—							
6. Effort	.46**	.39**	.40**	.38**	.45**	—						
7. Commitment	.54**	.37**	.44**	.46**	.50**	.68**	—					
8. Enjoyment	.54**	.37**	.35**	.41**	.46**	.56**	.65**	—				
9. Task self-efficacy	.25**	.33**	.32**	.36**	.35**	.20**	.18*	.15*	—			
10. Prosocial behavior	.13	.24**	.24**	.26**	.24**	-.03	-.07	.01	.11	—		
11. Antisocial behavior	.05	.13	.07	.05	.09	-.01	.04	.10	.04	.19*	—	
12. Rugby experience	.17*	.15	.17*	.13	.17*	.22**	.23**	.15	.22**	-.01	.17*	—

Note. PCE = Perceived Coaching Effectiveness. \* $p < .05$  \*\* $p < .01$ . Correlations involving rugby experience are based on  $n = 154$ .

**Table 4 Hierarchical Regression of Outcome Variables on Perceived Coaching Effectiveness Dimensions**

Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	$\Delta R^2$	<i>F</i> Change
<b>Effort</b>						
Step 1					.05 <sup>b</sup>	7.42
Rugby experience	.04	.01	.22	2.72 <sup>b</sup>		
Step 2					.22 <sup>c</sup>	44.89
Motivation PCE	.30	.04	.47	6.70 <sup>c</sup>		
<b>Commitment</b>						
Step 1					.05 <sup>b</sup>	7.42
Rugby experience	.04	.01	.23	2.89 <sup>b</sup>		
Step 2					.27 <sup>c</sup>	59.15
Motivation PCE	.29	.04	.51	7.45 <sup>c</sup>		
<b>Enjoyment</b>						
Step 1					.02	3.47
Rugby experience	.03	.01	.15	1.86		
Step 2					.28 <sup>c</sup>	60.19
Motivation PCE	.34	.04	.52	7.44 <sup>c</sup>		
<b>Task self-efficacy</b>						
Step 1					.05 <sup>b</sup>	7.85
Rugby experience	.06	.02	.22	2.80 <sup>b</sup>		
Step 2					.08 <sup>b</sup>	13.80
Technique PCE	.26	.07	.29	3.73 <sup>c</sup>		
Variable	<i>B</i>	<i>SE B</i>	$\beta$	<i>t</i>	$\Delta R^2$	<i>F</i> Change
<b>Prosocial behavior</b>						
Step 1					.00	0.01
Rugby experience	.00	.02	-.01	-0.07		
Step 2					.07 <sup>c</sup>	11.27
Character building PCE	.17	.05	.27	3.36 <sup>c</sup>		
<b>Antisocial behavior</b>						
Step 1					.03 <sup>a</sup>	4.66
Rugby experience	.02	.01	.17	2.16 <sup>a</sup>		
Step 2					.00	0.33
Character building PCE	.02	.04	.05	0.57		

Note. PCE = Perceived Coaching Effectiveness.  $\Delta R^2 = R^2$  unique to each step; *df* for *F* Change are 1, 152 for Step 1 and 1, 151 for Step 2; <sup>a</sup>*p* < .05, <sup>b</sup>*p* < .01, <sup>c</sup>*p* < .001.

For self-efficacy, perceived technique effectiveness was used as the predictor variable, because self-efficacy, as measured in this study, concerns athletes' confidence in independent skills, and technique effectiveness refers to athletes' perceptions of their coach's effectiveness to teach athletes new skills. After controlling for rugby experience, which accounted for 5% of the variance, technique positively predicted self-efficacy accounting for an additional 8% of the variance.



Character building was used as the predictor of prosocial and antisocial behavior because this dimension of coaching has been proposed to be related to sportsmanlike conduct (Feltz et al., 1999) and was the dimension with the highest bivariate correlation with prosocial behavior. Rugby experience did not account for any variance in prosocial behavior. Character building effectiveness positively predicted prosocial behavior explaining 7% of its variance. Rugby experience predicted 3% of the variance in antisocial behavior, whereas character-building effectiveness had no effect on this variable.

## Discussion

In the conceptual model of coaching efficacy, important outcomes for both coaches and athletes are hypothesized to result from high efficacy in four domains identified as important for coaching effectiveness (see Feltz et al., 1999). However, contemporary models of coaching effectiveness highlight the significance of athletes' *perceptions* of coaches' behaviors when examining athlete-related outcomes (Horn, 2002; Smoll & Smith, 1989). Consequently, this study sought to investigate whether rugby players' perceptions of their coach's effectiveness on the four coaching efficacy domains were associated with their own levels of effort, commitment, enjoyment, self-efficacy, as well as prosocial and antisocial behavior in rugby.

The current study used an adapted version of the CES to measure athletes' perceptions of coaching effectiveness on the four coaching efficacy domains. CFA showed that the factor structure identified for the CES also had a satisfactory fit to the data, with one exception: In our study, we chose to omit one item originally designed to measure motivation (Feltz et al., 1999), whereas Feltz et al. (1999) chose to cross-load this item on motivation and game strategy. Similar to Feltz et al. (1999), Myers, Feltz et al. (2006) also cross-loaded this item on motivation and game strategy and reported the presence of the same four first-order factors in their scale of coaching competency. Thus, the three scales measuring coaching efficacy, effectiveness, and competency have displayed the same four first-order factors, demonstrating the stability of these factors.

Based on the conceptual model of coaching efficacy (Feltz et al., 1999), we hypothesized that motivation effectiveness would positively predict two indices of motivation: effort and commitment. Consistent with our hypotheses, when perceiving their coach to be high in motivation effectiveness, athletes were more likely to report trying hard and being dedicated to playing rugby. Perceived motivation effectiveness pertained to athletes' perceptions that their coach was effective in motivating them, helping them maintain their confidence, building their self-esteem, and building team cohesion. Our findings suggest that these skills may be key features of coaching that have the potential to influence both effort and commitment. These findings reinforce the importance of formal training for coaches that develops their effectiveness in these skills.

Consistent with our hypothesis, perceived motivation effectiveness also positively predicted sport enjoyment. Thus, athletes who perceived that their coach was effective in the key features of coaching discussed above were more likely to report enjoying playing rugby. Although athletes' enjoyment has not been examined in relation to the coaching efficacy model, some studies have investigated satisfaction, which is conceptually similar to enjoyment. For example, Feltz et al. (1999)

found a relationship between athletes' satisfaction with their coach and their coach's efficacy and Myers, Wolfe, and colleagues (2006) found the same relationship for athletes' perceptions of their coach's motivation competence. Taken together with past research, the findings of the current study highlight the importance of this coaching dimension in enhancing athlete enjoyment and satisfaction. Identifying coaching aspects that could influence enjoyment in sport is important because enjoyment has been consistently linked with sport commitment (e.g., Carpenter et al., 1993), and athletes who are committed to their sport, but experience low levels of enjoyment, are more likely to experience burnout (Raedeke, 1997).

As hypothesized, perceived technique effectiveness positively predicted self-efficacy in rugby. Athletes who perceived their coach as effective in technique were more likely to report being more confident in executing key rugby skills, such as tackling opposition players, making accurate passes, and catching the ball. Inspection of the items measuring technique effectiveness may offer insight into how this dimension may influence athlete self-efficacy. Two of the items refer to the coach's ability to coach individual athletes on technique and demonstrate the skills of his sport. First, coaching *individual* athletes on technique allows the coach to incorporate drills that are suitable for the skill level of *each* athlete. Such individual-based drills could provide athletes with opportunities for mastery experiences, the most influential source of personal efficacy information (Bandura, 1997), and the most powerful contributor to efficacy beliefs in sport situations (Chase, Feltz, & Lirgg, 2003). Second, demonstrating the skills of the sport provides athletes with the opportunity to enhance their self-efficacy through modeling. It is well known that vicarious experiences play a very important role in the development of self-efficacy (Bandura, 1997). Thus, it was not surprising that perceiving coaches as effective in coaching individual athletes on technique and demonstrating the skills of their sport was linked to athletes' self-efficacy.

Although we selected perceived technique effectiveness as the predictor variable for athlete efficacy, self-efficacy may also be influenced by other dimensions of coaching effectiveness such as motivation and game strategy. Motivation, in part, reflects perceptions that coaches are effective in helping athletes build and maintain their *confidence*. Perceiving the coach to be high in this dimension implies that athletes perceive coaching behaviors that enhance their self-confidence. It is unknown what behaviors these might be. However, the coach acting confident, instruction-drilling, and encouraging positive talk have been identified by college athletes (Vargas-Tonsing, Myers, & Feltz, 2004) and elite and national team coaches (Gould, Hodge, Peterson, & Giannini, 1989) as three of the most effective efficacy-enhancing techniques employed by coaches. Game strategy pertains to perceptions that a coach is effective in leading the team to success during competition. Successful performances are a form of mastery experience that should have a positive impact on self-efficacy (Bandura, 1997). Thus, motivation and game strategy may also have implications for athlete self-efficacy. Indeed, both these dimensions were positively and significantly related to players' self-efficacy as indicated by the zero-order correlations.

Consistent with our hypothesis, perceived character-building effectiveness predicted athletes' prosocial behavior; however, it was unrelated to antisocial behavior. Thus, perceiving the coach as being effective in instilling an attitude of good moral character, fair play, and respect for others, and promoting sportsmanship

may lead to an increased frequency of desirable behaviors but does not appear to have any effect on antisocial conduct. The manner the character-building dimension is measured may explain the lack of a relationship with antisocial behavior. Specifically, the items focus on promoting *good* moral character, an attitude of *fair play*, *good* sportsmanship, and *respect* for others, which are all positive aspects of morality. Instead, antisocial behavior refers to negative aspects of morality, such as retaliating to a bad tackle and trying to injure an opponent; high morality is inferred by low frequency of these behaviors. Including items that specifically measure a coach's efficacy/effectiveness to reduce antisocial conduct as well as to promote prosocial acts may enhance the predictability of this scale. It is also possible that such items may form a separate subscale, which would measure the ability of the coach to reduce athlete antisocial conduct in sport.

## Practical Implications

The findings of the current research suggest that athletes' perceptions of their coach's effectiveness on technique, motivation, game strategy, and character building have important implications for some key aspects of their experiences in rugby. Specifically, these dimensions of coaching have implications for rugby players' effort, commitment, enjoyment, self-efficacy, and prosocial behavior in the field. Thus, coaches need to be made aware of their potentially influential role on these key aspects of athletes' psychological functioning and understand that through their behavior they can substantially affect the quality of the athletic experience. Based on our findings, those implementing coach education programs should consider including specific guidelines on how coaches could develop their effectiveness in motivation, game strategy, technique, and character building. Coaches should also be made aware that their influence on athletes may be exerted through athletes' perceptions of their effectiveness.

## Study Limitations and Future Research Directions

Although this study has reported some interesting findings, it does have some limitations and our findings need to be interpreted with those in mind. The first limitation is that we analyzed the data using standard regression rather than multilevel modeling. The latter technique is recommended when observations are nested within groups, as was the case here: We had data from 166 athletes nested within nine teams. Unlike multilevel modeling, standard regression assumes that all responses are randomly sampled from one population and therefore are independent. Because the grouping of athletes within teams is ignored, variability due to this grouping is measured as error, causing the errors of individuals from the same groups to be related. Analyzing nested data with standard regression can lead to increased likelihood of a type I error and ignoring group-level influences if these exist.

Even though multilevel modeling would have been the ideal technique to analyze our data, we were unable to conduct this type of analysis. Multilevel modeling is not recommended when the number of groups is substantially lower than 50, as it can lead to biased estimates of second-level standard errors (Mass & Hox, 2004). Because we only had nine teams, analyzing the data using multilevel modeling

would have provided unreliable findings in this case. However, we strongly recommend that future research replicates the present findings with a larger sample size using multilevel modeling.

A second limitation involves the alpha coefficient of the prosocial behavior scale, which fell just below the acceptable level of .70: low levels of criterion reliability attenuate the magnitude of the measured relationship between two variables (Schmitt, 1996). The low alpha may have been in part due to the small number of items (i.e., three) in this scale (see Cortina, 1993). Nevertheless, findings involving this subscale should be interpreted with caution, and future research should employ instruments with a greater number of prosocial behavior items. Third, this study employed adult male rugby players, and therefore our findings can be generalized only to a similar population. Future research should replicate the present findings with athletes from other sports. Finally, the cross-sectional nature of the study limits our ability to establish cause and effect relationships. Future research should employ quasi-experimental designs, by training coaches to be more effective on the coaching efficacy domains, and examine the effects of this training on the outcome variables examined in this study.

## Conclusion

In conclusion, this work has extended the research paradigm initiated by Feltz et al. (1999) and provided preliminary evidence for a link between perceptions of coaching effectiveness and important athlete variables. Overall, our findings are consistent with the conceptual model of coaching efficacy and point to the importance of measuring athletes' perceptions of coaching effectiveness on motivation, technique, game strategy, and character building. Clearly, perceiving the coach as effective in these domains has the potential to affect athletes' commitment, effort, enjoyment, efficacy, and prosocial behavior.

## Notes

1. Although this item had a factor loading of .61 on motivation in this model, a model in which the item was allowed to cross load on game strategy indicated that the item was a *better* indicator of game strategy (factor loading = .76) than motivation (factor loading = .01). Based on the above, we chose to drop this item from further analyses. However, this item has been used as an indicator of motivation in studies of coaching efficacy (Feltz et al., 1999), competency (Myers, Feltz et al., 2006), and effectiveness (Kavussanu et al., in press). Therefore, future research should examine the long-term utility of this item.
2. Similar to past research (Feltz et al., 1999; Kavussanu et al., in press; Myers, Feltz, et al., 2006), we also examined whether the four first-order factors converged on one second-order factor. The fit of the second-order model approached that of the first-order model and was therefore accepted (see Marsh, 1987),  $R\chi^2(226) = 366.36$ ,  $R\chi^2/df = 1.62$ , CFI = .89, RMSEA = .06, SRMR = .06, CAIC = -1015.

## Acknowledgments

The authors would like to thank Ed Maaye and Ian Pearce for their help with data collection.

## References

- Alexandris, K., Zahariadis, P., Tsorbatzoudis, C., & Grouios, G. (2002). Testing the sport commitment model in the context of exercise and fitness participation. *Journal of Sport Behavior*, 25, 217–230.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman & Company.
- Bandura, A. (2001). *Guidelines for constructing self-efficacy scales*. Palo Alto, CA: Stanford University.
- Carpenter, P.J., Scanlan, T.K., Simons, J.P., & Lobel, M. (1993). A test of the sport commitment model using structural equation modeling. *Journal of Sport and Exercise Psychology*, 15, 119–133.
- Cattell, R.B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research*, 1, 245–276.
- Chase, M.A., Feltz, D.L., & Lirgg, C.D. (2003). Sources of collective and individual efficacy of collegiate athletes. *International Journal of Sport and Exercise Psychology*, 1, 180–191.
- Chelladurai, P., & Riemer, H.A. (1997). A classification of the facets of athlete satisfaction. *Journal of Sport Management*, 11, 133–159.
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159.
- Cortina, J.M. (1993). What is coefficient alpha? An examination of theory and applications. *The Journal of Applied Psychology*, 78, 98–104.
- Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297–334.
- Eisenberg, N., & Mussen, P.H. (1998). *The roots of prosocial behavior in children*. Cambridge: Cambridge University Press.
- Feltz, D.L. (1988). Self-confidence and sports performance. In K.B. Pandolf (Ed.), *Exercise and Sport Sciences Reviews* (pp. 423–457). New York: Macmillan.
- Feltz, D.L., Chase, M.A., Moritz, S.E., & Sullivan, P.J. (1999). A conceptual model of coaching efficacy: Preliminary investigation and instrument development. *Journal of Educational Psychology*, 91, 765–776.
- Gould, D., Hodge, K., Peterson, K., & Giannini, J. (1989). An exploratory examination of strategies used by elite coaches to enhance self-efficacy in athletes. *Journal of Sport and Exercise Psychology*, 11, 128–140.
- Horn, T.S. (2002). Coaching effectiveness in the sports domain. In T.S. Horn (Ed.), *Advances in sport psychology* (pp. 309–354). Champaign, IL: Human Kinetics.
- Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Kavussanu, M. (2006). Motivational predictors of prosocial and antisocial behaviour in football. *Journal of Sports Sciences*, 24, 575–588.
- Kavussanu, M., Boardley, I.D., Jutkiewicz, N., Vincent, S., & Ring, C. (in press). Coaching efficacy and coaching effectiveness: Examining their predictors and comparing coaches' and athletes' reports. *The Sport Psychologist*.
- Kent, A., & Sullivan, P.J. (2003). Coaching efficacy as a predictor of university coaches' commitment. *International Sports Journal*, 7, 78–88.
- Kline, R. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York: The Guilford Press.
- Maehr, M.L., & Braskamp, L.A. (1986). *The motivation factor: A theory of personal investment*. Lexington, MA: Lexington Books.

- Maehr, M.L., & Nicholls, J. (1980). Culture and achievement motivation: A second look. In N. Warren (Ed.), *Studies in cross-cultural psychology* (Vol. 2, pp. 53–75). New York: Academic Press.
- Marsh, H.W. (1987). The hierarchical structure of self-concept and the application of hierarchical confirmatory factor analysis. *Journal of Educational Measurement*, 24, 17–39.
- Mass, C.J.M., & Hox, J.J. (2004). Robustness issues in multilevel regression analysis. *Statistica Neerlandica*, 58, 127–137.
- McAuley, E., Duncan, T., & Tammien, V.V. (1989). Psychometric properties of the intrinsic motivation inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, 60, 48–58.
- Myers, N.D., Vargas-Tonsing, T.M., & Feltz, D.L. (2005). Coaching efficacy in intercollegiate coaches: Sources, coaching behavior, and team variables. *Psychology of Sport and Exercise*, 6, 129–143.
- Myers, N.D., Feltz, D.L., Maier, K.S., Wolfe, E.W., & Reckase, M.D. (2006). Athletes' evaluations of their head coach's coaching competency. *Research Quarterly for Exercise and Sport*, 77, 111–121.
- Myers, N.D., Wolfe, E.W., Maier, K.S., Feltz, D.L., & Reckase, M.D. (2006). Extending validity evidence for multidimensional measures of coaching competency. *Research Quarterly for Exercise and Sport*, 77, 451–563.
- Nunnally, J.C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.
- Raedeke, T.D. (1997). Is athlete burnout more than just stress? A sport commitment perspective. *Journal of Sport and Exercise Psychology*, 19, 396–417.
- Ryan, R.M. (1982). Control and information in the interpersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43, 450–461.
- Sage, L., Kavussanu, M., & Duda, J.L. (2006). Goal orientations and moral identity as predictors of prosocial and antisocial functioning in male association football players. *Journal of Sports Sciences*, 24, 455–466.
- Scanlan, T.K., Carpenter, P.J., Schmidt, G.W., Simons, J.P., & Keeler, B. (1993). An introduction to the sport commitment model. *Journal of Sport and Exercise Psychology*, 15, 1–15.
- Scanlan, T.K., Simons, J.P., Carpenter, P.J., Schmidt, G.W., & Keeler, B. (1993). The sport commitment model: Measurement development for the youth sport domain. *Journal of Sport and Exercise Psychology*, 15, 16–38.
- Schmitt, N. (1996). Uses and abuses of coefficient alpha. *Psychological Assessment*, 8, 350–353.
- Smoll, F.L., & Smith, R.E. (1989). Leadership behaviors in sport: A theoretical model and research paradigm. *Journal of Applied Social Psychology*, 19, 1522–1551.
- Sullivan, P.J., & Kent, A. (2003). Coaching efficacy as a predictor of leadership style in intercollegiate athletics. *Journal of Applied Sport Psychology*, 15, 1–11.
- Vargas-Tonsing, T.M., Myers, N.D., & Feltz, D.L. (2004). Coaches' and athletes' perceptions of efficacy-enhancing techniques. *The Sport Psychologist*, 18, 397–414.
- Vargas-Tonsing, T.M., Warners, A.L., & Feltz, D.L. (2003). The predictability of coaching efficacy on team efficacy and player efficacy in volleyball. *Journal of Sport Behavior*, 26, 396–407.
- Weiss, M.R., Kimmel, L.A., & Smith, A.L. (2001). Determinants of sport commitment among junior tennis players: Enjoyment as a mediating variable. *Pediatric Exercise Science*, 13, 131–144.
- Wilson, P.M., Rodgers, W.M., Carpenter, P.J., Hall, C., Hardy, J., & Fraser, S.N. (2004). The relationship between commitment and exercise behavior. *Psychology of Sport and Exercise*, 5, 405–421.